

Class Expectations and Syllabus

Advanced Placement Biology 2018 – 2019
Princeton Day School

CONTACT INFORMATION

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Schoology page:

<https://lms.pds.org/course/1686774668/>

COURSE OVERVIEW

Welcome to AP Biology!



Charlie Harper, 1961

The College Board AP Biology curriculum emphasizes the four BIG IDEAS of Biology and focuses on seven major science practices. This class will enable you to develop a strong conceptual understanding of biological processes and integrate that knowledge into meaningful discussions, engaging activities, and inquiry-based laboratory investigations.

Big Idea 1: Evolution

The process of evolution drives the diversity and unity of life.

Big Idea 2: Cellular Processes: Energy and Communication

Biological systems utilize free energy and molecular building blocks to grow, to reproduce, and to maintain dynamic homeostasis.

Big Idea 3: Genetics and Information Transfer

Living systems store, retrieve, transmit, and respond to information essential to life processes.

Big Idea 4: Interactions

Biological systems interact, and these systems and their interactions possess complex properties.

The Emphasis on Science Practices:

A practice is a way to coordinate knowledge and skills in order to accomplish a goal or task. The science practices enable you to establish lines of evidence and use them to develop and refine testable explanations and predictions of natural phenomena. Because content, inquiry, and reasoning are equally important in AP Biology, each learning objective combines content with inquiry and reasoning skills described in the science practices. The science practices capture important aspects of the work that scientists engage in, at the level of competence expected of you, an AP Biology student.

<https://apstudent.collegeboard.org/apcourse/ap-biology/course-details>

While these fundamental topics are listed above, it would serve you well to educate yourself on how these ideas relate to the actual course and test. There are many resources to assist you as you speed through a year of AP Biology. Here are a few important ones to get you started (these will also be linked to our Schoology site).

AP Biology Course /Exam resources:

AP College Board Course overview:
<https://apstudent.collegeboard.org/apcourse/ap-biology>

Bozeman science - About the redesigned AP Biology Exam:
<http://www.bozemanscience.com/new-ap-biology-exam-users-guide>

Extra Lecture Resources:

MIT Fundamentals of Biology Lectures
<http://tinyurl.com/pkpefqk>

Bozeman AP Biology Tutorials
<http://www.bozemanscience.com/ap-biology/>

Learning resources:

TED Talks and Educational Resources:
<https://www.ted.com/topics/biology>

HHMI Interactive Tutorials:
<http://www.hhmi.org/biointeractive>

MATERIALS (links below are for clarification purposes only – feel free to purchase or rent through any vendor):

Textbook*: *Biology 11th (AP) edition* by Raven, et al., McGraw Hill Education © 2017 OR
Biology 10th (AP) edition by Raven, et al., McGraw Hill Education © 2014

(https://www.amazon.com/Biology-Peter-Raven/dp/1259188132/ref=mt_hardcover?_encoding=UTF8&me=)

Lab Manual*: *AP Biology Investigative Labs: An Inquiry-Based Approach*, College Board © 2012
(FREE online: available on our schoology page)

Lab Notebook*: *Life Sciences Student Lab Notebook* (70 carbonless duplicate sets, spiral bound), Hayden-McNeil
(<https://www.amazon.com/Life-Sciences-Student-Lab-Notebook/dp/1930882351>)

*** required**

Notebook: Any large (1.5”+) 3-ring binder with lined paper and 3 hole punch / folders for any handouts (recommended)

AP Biology Study Guide *optional*; but if you do decide to purchase one, be sure it was published after 2013, as the curriculum was significantly redesigned; old study guides and tests will not sufficiently help prepare you for this year’s exam. Updated Kaplan and Princeton Review versions are highly rated. Below are the most recent editions of those:

<https://tinyurl.com/yd42cyrg>

<https://tinyurl.com/y75um7v5>

You should bring your laptop (preferred) or iPad to class daily, especially if you use one for taking notes. Throughout the year, we will have many needs for devices (app based activities, probe data analysis, presentations, etc.). Since you are upperclassmen, I expect you to use these devices appropriately (no texting, games, etc.) or they will be confiscated.

EXPECTATIONS / POLICIES

ATTENDANCE (Come to class)

Work done in school cannot usually be replicated at home, especially activities and labs. If you know of an absence in advance (holiday, trip, sporting event), let me know immediately so we can prepare accordingly. If you are absent for anything unforeseen (illness, emergency), please email me that day if possible.

When you are absent from class, **you are responsible** for finding out what you missed (either by looking at the cycle syllabus or by emailing me or a classmate). Depending on the assignment, you may be expected to hand the work in upon your return to school. If you have an excused absence due to illness or family emergency, you will be expected to make up the work in a reasonable timeframe (~ one class per class absent). Email me as soon as possible to arrange this. Missed tests will be made up the **day of return** to class and may be given in essay form.

TARDINESS (Come to class on time)

Tardiness will not be accepted; we only have 70 minute periods (5 times a cycle) in which to pack a significant amount of material, especially during activities and labs. You are to be here when class starts. If you are not and don’t have a valid pass, you will be considered late. If this occurs three times in one semester, one percentage point will be deducted from your final semester grade.

HOMEWORK (Come to class prepared)

Prepare, prepare, prepare! You will not be graded on homework, yet you will need to stay on top of the material to do well in this class. This is a challenging **college level course** that requires a considerable amount of work outside of class. Typically for college classes, up to 3 hours of independent study should be done for each hour of class. While I don’t necessarily expect that, you will need to carve out blocks of time from your busy life, then prioritize and manage that time well. Please let me know if you need help with this.

HIGH STANDARDS OF WORK (Come to class like an AP Bio rock star)

Think before speaking. Read questions before answering. Write in complete sentences. Show your work. Design your own experiments. Keep an organized lab notebook. Label all graphs. Clean up your area. Put pride into your work. Dazzle me...

OTHER POLICIES

Participation: Always be prepared for class so you can fully participate. The goal of this class is to promote more discussion and small group analysis of information (more lab time, less lecture time). For this to work, you must be committed to completing the work required outside of class, and to actively participate during class time.

Collaboration: You may work together in class during group and lab activities and discuss the material as much as you want. Individual writing assignments and reports however, are individual efforts and will be graded as such. If you are not sure what constitutes as collaboration versus plagiarism, it is better to consult the student handbook or ask me to clear up any confusion before a problem arises.

Late Work: All work is expected at its due date. However, late work will be accepted with the following penalties:

- Late activities, assignments, and reading notes will be deducted at 10% the original grade per day for 2 days, after which they will no longer be accepted for a grade (i.e., a 20 point assignment due Monday at 8:00 am will be deducted 2 late points if handed in between Monday 8:01 am and Tuesday 8:00am, and 4 late points between Tuesday 8:01 am and Wednesday 8:00am). After that point, no credit will be awarded. This is a department policy and cannot be waived.

- Formal lab reports will be deducted at 10% per day for 10 days. As lab reports are typically 50 points, 5 points per day penalty will be deducted.

Food and Drink: In a science classroom, there are chemicals, live specimens and other dangerous materials. For this reason, there is to be no eating, chewing gum or drinking in our class. You may leave a closed drink on the front table or in your backpack – please don't take advantage of this privilege.

See the student handbook for policies not explicitly stated here.

CLASS FORMAT

Class will meet for 70 minute periods five times a cycle (5/7 days). You will be expected to read all material before we cover it in class (make sure to adhere to our weekly syllabus) to fully participate in discussions, activities and labs. I will give mini-lectures (approx. 30-45 minutes of the period) when introducing a new topic or chapter. These will be given in a slide presentation and will be available on Schoology (for download) before class.

Labs and activities make up a significant portion of the class (25% of our year must be spent on the official AP Biology Labs). We will also perform relevant experiments, discuss case studies, and model certain phenomena to help bolster your knowledge (of the content and science practices) of Biology throughout the year.

I hope to hold question and answer review sessions to tie up any loose ends before each major test, and I will also provide practice multiple choice and free response questions during that review. These will be student-led, teacher-facilitated sessions (come with questions – no lectures).

GRADING

PDS uses the traditional A-F grading system found here:

<https://www.pds.org/school-life/student-handbook/us-handbook>

Assessments (tests and quizzes) will be based on practice AP exam questions and free response prompts, and will be graded using AP rubrics. While you will receive a percentage grade for gradebook purposes, you may also be given a hypothetical AP 1-5 score. Lab reports, projects and presentations will also count for a significant portion of your grade. Your final semester grades will be comprised of the total points accumulated from tests, quizzes, labs and additional classwork. AP Biology culminates with the AP Biology National exam; there will be no final exam for this course.

Our tentative yearly schedule is as follows (*dates are subject to change with school closures, assemblies, etc.*)

UNIT	TOPICS COVERED	TEXT	MAJOR LABS and ACTIVITIES	GUIDELINES	APPROX TIMING
SUMMER ASSIGNMENT Evolution and Phylogeny	Evidence of Evolution, Darwin's Finches Natural Selection Speciation Systematics, Cladistics & Classification	Chapters: 21, 20, 22, 23, 24	AP Biology <i>Investigative Lab 1: Artificial Selection</i> Evolution in Action: Data Analysis Cladogram Activity	Big Ideas: 1, 2, 3, 4 Enduring Understandings: 1A, 1B, 1C, 1D, 2E, 3C, 4B, 4C	9 classes
Unit 1: Biochemistry and the Origin of Life	Chemical Bonding, Water, pH Macromolecules Origin and Diversity of Life	Chapters: 1, 2, 3, 26	Case Study and Experimental Design: A Cool Glass of Water Macromolecule Construction Activity Case Study: Spark of Life	Big Ideas: 1, 2, 3, 4 Enduring Understandings: 1D, 2A, 3A, 4A, 4B	7 classes
Unit 2: Introduction to The Cell	Cell Theory, Prokaryotes & Eukaryotes, Cell Organelles Cell Membrane, Transport Cell Communication	Chapters: 4, 5, 9	Microscopy Inquiry Lab: Animal and Plant Cells AP Biology <i>Investigative Lab 4: Diffusion and Osmosis</i>	Big Ideas: 1, 2, 4 Enduring Understandings: 1B, 2A, 2B, 4A, 4B, 4C	8 classes
Unit 3: Cellular Energy	Metabolism, Enzyme Structure & Function Cellular Respiration ATP Photosynthesis, Evolution of CAM & C4	Chapters: 6, 7, 8	AP Biology <i>Investigative Lab 13: Enzyme Activity</i> Case Study: Can of Bull AP Biology <i>Investigative Lab 5: Photosynthesis</i>	Big Ideas: 1, 2, 4 Enduring Understandings: 1B, 1D, 2A, 4A, 4B, 4C	8 classes
Unit 4: Cell Cycle & Cell Division	Chromosomes, Cell Cycle, Mitosis, Cell Cycle Control Sexual Reproduction, Meiosis	Chapters: 10, 11	Presentations: Current Research on Cancer AP Biology <i>Investigative Lab 7: Cell Division – Mitosis and Meiosis</i>	Big Ideas: 1, 2, 3, 4 Enduring Understandings: 1B, 2E, 3A, 3B, 3C, 3D, 4A	8 classes

UNIT	TOPICS COVERED	TEXT	MAJOR LABS and ACTIVITIES	GUIDELINES	APPROX TIMING
Unit 5: Mendelian Genetics & Heredity	Mendelian & Non-Mendelian Laws of Heredity, Pedigrees Sex Linkage & Chromosomes, Mapping, Genetic Disorders	Chapters: 12, 13	Genetics Problems “It Skips a Generation” Cucumber Genetics Activity with Chi Square Analysis Pedigree Analysis Presentation: Genetic Disorders	Big Ideas: 3, 4 Enduring Understandings: 3A, 3B, 3C, 4C	6 classes
Unit 6: Molecular Genetics & Biotechnology	Molecular Basis of Inheritance, DNA Structure & Replication Central Dogma, Genes, Code, Transcription & Translation, Gene Expression, Mutation Control of Gene Expression, Gene Regulation Biotechnology, Genome Analysis	Chapters: 14, 15, 16, 17, 18	AP Biology <i>Investigative</i> Lab 8: Biotechnology: Bacterial Transformation AP Biology <i>Investigative</i> Lab 9: Biotechnology: Restriction Enzyme Analysis of DNA Case Study: Golden Rice: An Intimate Debate Case	Big Ideas: 1, 2, 3, 4 Enduring Understandings: 1A, 1B, 1D, 2C, 2E, 3A, 3B, 3C, 3D, 4A, 4C	12 classes
WINTER BREAK ASSIGNMENT	Cellular Mechanisms of Development Evolution of Development Animal Development	Chapters: 19, 25, 53	Winter Break Guided Reading Notes	Big Ideas: 1, 2, 3, 4 Enduring Understandings: 1A, 2C, 2E, 3A, 3B, 3C, 3D, 4A	Winter Break
Unit 7: Microbes	Viruses Prokaryotes Fungi	Chapters: 27, 28, 32	Case Study: A Simple Plan: E.L. Trudeau, the Rabbit Island Experiment, and Tuberculosis Treatment Viral Transmission Activity	Big Ideas: 1, 2, 3, 4 Enduring Understandings: 1A, 1C, 1D, 2A, 2B, 2D, 2E, 3A, 3B, 3C, 3D, 4B, 4C	6 classes

UNIT	TOPICS COVERED	TEXT	MAJOR LABS and ACTIVITIES	GUIDELINES	APPROX TIMING
Unit 8: Animals, Cell Communication, and Human Systems	Animals: Body Plans, Proto & Deuterostomes Human Body and Regulation Nervous System Endocrine System Immune System	Chapters: 33, 34, 35, 42, 43, 45, 51	Animal Phyla Activity Class Presentations: Current Research on Immunology Projects on Human Systems	Big Ideas: 1, 2, 3, 4 Enduring Understandings: 1B, 2A, 2C, 2D, 2E, 3D, 3E, 4B, 4C	12 classes
Unit 9: Plants	Evolution of Plants Plant Form and Function Plant Transport	Chapters: 30, 31, 36, 37	Microscopy Lab: Plant Tissues AP Biology <i>Investigative</i> Lab 11: Transpiration	Big Ideas: 2, 4 Enduring Understandings: 2A, 2D, 2E, 4A, 4C	8 classes
SPRING BREAK ASSIGNMENT	Plant Defense Response Plants Sensory Systems Plant Reproduction	Chapters: 39, 40, 41	Spring Break Guided Reading Notes Refutational writing: "Misconceptions about Plant Reproduction"	Big Ideas: 1, 2, 3, 4 Enduring Understandings: 1A, 2A, 2C, 2D, 2E, 3B 3D, 3E, 4C	Spring Break
Unit 10: Ecology	Behavioral Biology Individuals & Population Ecology Community & Ecosystems Ecology Conservation Biology	Chapters: 54, 55, 56, 57, 59	AP Biology <i>Investigative</i> Lab 12: Fruit Fly Behavior Invasive Species Survey and Data Analysis	Big Ideas: 1, 2, 3, 4 Enduring Understandings: 1A, 1C, 2A, 2C, 2D, 2E, 3E, 4A, 4B, 4C	10 classes
WRAP UP & REVIEW	Wrap up any loose ends Review for AP Biology Exam in May	All chapters	Review Activities Review Videos Review Games	All concepts covered throughout the course	12 classes
AFTER THE EXAM	Student Projects		Dive deeper into interesting subjects		

AP BIOLOGY EXAM

Exam Date: MONDAY MAY 13, 2019, 8:00am

The exam is approximately three hours long and has two parts — multiple choice and grid-in, and free response. Each section is worth 50% of the final exam grade.

Questions will assess your understanding of the big ideas, enduring understandings, and essential knowledge and your application of these through the science practices. These may include questions on the following:

- the use of modeling to explain biological principles
- the use of mathematical processes to explain concepts
- the making of predictions and the justification of phenomena
- the implementation of experimental design
- the manipulation and interpretation of data

Section I: Multiple Choice (1 hour and 30 minutes)

Part A — 63 Multiple Choice Questions

Part B — 6 Grid-In Questions

The grid-in questions focus on the integration of science and mathematical skills.

Total scores on the multiple-choice section are based on the number of questions answered correctly. Points are not deducted for incorrect answers and no points are awarded for unanswered questions.

Section	Question Type	Number of Questions	Scoring		Timing
I	Part A: Multiple Choice	63	50% of the final score		90 minutes
	Part B: Grid-In	6			
II	Long Free Response	2	25% of the final score	Each question will be scored on a 0–10 point scale and will contribute 12.5% of the exam’s composite score. Students will have approximately 20–25 minutes to answer each question.	80 minutes + 10-minute reading period
	Short Free Response	6	25% of the final score	Each form will include three 3-point and three 4-point short free-response questions. Students will have approximately 3–10 minutes to answer each question.	

www.media.collegeboard.com

Section II: Free Response (1 hour and 20 minutes plus a mandatory 10 minute reading period)

8 Questions (2 long and 6 short)

See scoring guidelines above.

AP Score Qualification:

5 (Extremely well qualified), 4 (Well qualified), 3 (Qualified), 2 (Possibly qualified), 1 (No recommendation)

Receiving credit for college courses:

In the majority of cases, a student who scores a 4 or 5 will receive college credit. In rare cases, a school may require a 5. All students should check the credit-and-placement policy at the schools to which they are applying. Policies vary from one institution to another and also may vary from department to department within an institution.

The purpose of this AP Biology Parent/Student Contract is to provide information to parents and students and facilitate your success in this academically challenging course. Please read our entire syllabus, expectations, and lab safety rules below; print out, sign and return to me, confirming your understanding and commitment to AP Biology.

1. I recognize that participation in AP Biology requires me to:
 - Demonstrate increased student independence
 - Take on a high degree of responsibility
 - Meet higher standards than other high school classes
2. I understand that AP Biology is the equivalent of a college level biology course and therefore, requires the same amount of work as a college level biology course (up to 3 hours of independent study for each hour of class).
3. I understand that between labs, activities, lectures and reviews, there is really no sufficient way to make up a missed class, therefore, it is essential that I attend every class and am prepared to participate.
 - Missed tests will be made up the day of return to class and may be in essay form.
 - With excused absences, I am responsible for making up work within a 'one day per day absent' timeframe.
 - Late work will not be accepted (except under very specific circumstances, at the discretion of Dr. Norin).
4. I understand that in order to cover everything that may appear on the AP Biology National Exam, this course must proceed at a rapid pace. Therefore, if I must attend review sessions and complete all class work.
5. I recognize that I am responsible for my own learning and success in class, not my parents, teacher, advisor, or friends. I will advocate for myself if I have concerns about my grade or need help with content.
6. I understand that lab safety is of extreme importance and I will abide by the safety rules below. I realize that if I am not following procedures I may be removed from the lab and receive a zero with no opportunity to make it up.
 1. I will act responsibly at all times in the laboratory.
 2. I will not fool around in the laboratory.
 3. I will follow all instructions about laboratory procedures given by the teacher, or pre-lab.
 4. I will leave my lab area as I found it, cleaning up after myself.
 5. I will wear my safety goggles and gloves when necessary and follow safety protocols.
 6. I know where the fire safety equipment is located in the lab and have been trained in its use.
 7. I will immediately notify the teacher of any emergency.
 8. I will tie back long hair, remove jewelry, and wear proper shoes while in lab.
 9. I will never work alone in the lab, unless instructed to do so.
 10. I will not take chemicals, equipment, or dissected parts from the lab without permission.
 11. I will NEVER eat or drink in the lab unless instructed to do so by the teacher.
 12. I will only handle living or preserved specimens when authorized to do so by the teacher.
 13. I will handle living specimens humanely.
 14. I will not enter or work in the storage room unless authorized to do so by the teacher.
 15. I will keep a copy of this contract as a reference.

I have read, understand, and will abide by the student expectations and the lab safety contract. I have read the course syllabus and confirm my commitment to this class.

Student name _____ (printed) Student signature _____ Date: _____

Parent signature _____ Date : _____

PLEASE FILL OUT IF APPLICABLE:

Extracurricular Activities / Sports I am involved in:

Any absences I know about in advance: